

ALBERTA ENERGY AND UTILITIES BOARD

Calgary Alberta

**NOVAGAS CANADA LTD.
APPLICATION TO MODIFY AN EXISTING
SOUR GAS PLANT AND CONSTRUCT AND
OPERATE A SOUR GAS PIPELINE
HARMATTAN- ELKTON FIELD
BP CANADA ENERGY COMPANY
APPLICATION TO MODIFY TWO
EXISTING SOUR GAS PLANTS
CAROLINE FIELD**

**Decision 2001-62
Applications No. 1072191 and 1072188**

1 INTRODUCTION

1.1 Application and Intervention

Application No. 1072191

Novagas Canada Ltd., operating under the trade name of TransCanada Midstream or TCM, (hereinafter referred to as Novagas) submitted an application to the Alberta Energy and Utilities Board (EUB/Board) in accordance with Section 26 (1)(b) of the Oil and Gas Conservation Act for approval to modify its existing Harmattan-Elkton sour gas plant located in the northeast quarter of Section 27 and the southeast quarter of 34-31-4W5M (Harmattan gas plant) by the installation of an additional line heater.

The facility is currently licensed to process 13 900 thousand cubic metres (10^3 m^3) per day of sour natural gas with a hydrogen sulphide (H_2S) content of 45 moles per kilomole (mol/kmol) (4.5 per cent), from which 11 660 10^3 m^3 per day of sales gas, hydrocarbon liquids, and 81.5 tonnes per day of sulphur are recovered. Sulphur emissions at the plant are up to 1.1 tonnes per day at maximum plant capacity based on a normal operating sulphur recovery efficiency of 98.6 per cent on a quarterly calendar reporting basis. The Harmattan gas plant's capacity and sulphur emission limits would remain unchanged.

In addition, Novagas submitted an application in accordance with Part 4 of the Pipeline Act for approval to construct and operate pipelines for the purpose of transporting sour gas from the existing North and South Caroline sour gas plants located at LSD 1-11-35-6W5M and LSD 3 and 4-20-34-4W5M respectively to the existing Harmattan gas plant. Further, the proposed pipeline would also transport natural gas from the existing Garrington gas plants located at LSD 11-17-34-3W5M (BP Garrington plant) and LSD 13-5-34-3W5M (Apache Garrington plant) to the Harmattan gas plant. The proposed pipeline would be approximately 63.5 kilometres (km) in length, with a maximum outside diameter of 323.9 millimetres (mm) and would transport sour gas with a maximum H_2S concentration of 25 mol/kmol (2.5 per cent). The proposed pipeline would be operated as a level-2 pipeline. At the hearing, Novagas amended the total length of its proposed pipeline to 60.79 km without amending the proposed pipeline route. Novagas referred to its proposed pipeline as the North Gas Gathering System (NGGS).

The location of the proposed pipeline route and its associated emergency planning zone (EPZ) are shown on the attached Figures 1 and 2. In addition, the regional map provided in Figure 2 shows the larger general area, including towns, villages, existing gas plants, and alternative pipeline routes discussed at the hearing. The figures are not to scale and are provided for illustration purposes only; they do not contain all of the details representative of the area.

Application No. 1072188

BP Canada Energy Company (BP) submitted an application in accordance with Section 26 (1)(b) of the Oil and Gas Conservation Act for approval to convert its existing North and South Caroline sour gas plants located at LSD 1-11-35-6W5M and LSD 3 and 4-20-34-4W5M respectively into sour gas compressor stations. The facilities would continue to stabilize some natural gas liquids and therefore would continue to be defined as gas plants. Additional electric compressors would be added to each site, and the existing dehydration equipment would be reconfigured. The existing sulphur recovery and liquid extraction/fractionation processes and associated equipment at each plant site would be discontinued, and the Caroline sour gas would be processed at the existing Harmattan gas plant.

Objections and Interventions

The EUB received objections to the proposed projects from area landowners following the submission of the subject applications. Subsequently, the EUB directed, pursuant to Section 29 of the Energy Resources Conservation Act, that a public hearing be held to consider Applications No. 1072191 and 1072188. The EUB received submissions from various interested parties on February 20, 2001, and April 12, 2001, regarding the subject applications.

1.2 Hearing

The hearing opened on March 20, 2001, in Sundre, Alberta. However, it was adjourned that same day, and the Board requested that the applicants and the Bergmans, Foran-Sheddens, and Aebli file additional materials. The applications and interventions were then considered at a public hearing in Olds, Alberta, on May 1 to 4, 2001, before G. Miller (Presiding Board Member), M. Bruni, Q.C. (Acting Board Member), and J. R. Nichol, P.Eng. (Acting Board Member). On May 2, 2001, the panel, staff, and hearing participants viewed the Bergmans' property and the surrounding area.

Those who appeared at the hearing and abbreviations used in this report are listed in the following table.

THOSE WHO APPEARED AT THE HEARING

Principals and Representatives (Abbreviations Used in Report)

Witnesses

Novagas Canada Ltd. A. Hollingworth, Q.C. N. Berge	M. Coughlin K. Foore K. Gilmore R. McKay G. Cano, P.Eng. B. Patterson
BP Canada Energy Company A. McLarty, Q.C. B. Selinger	K. Ormon, P.Eng. J. Hawkins
B. and J. Bergman, F. Foran, L. Aebli S. K. Luft T. D. Weiss	B. Bergman Dr. J. Bergman J. Bergman L. Shedden F. Foran L. Aebli
R. Watson	R. Watson
J. Hermann	J. Hermann
K. Pearson	K. Pearson
Alberta Energy and Utilities Board staff J. P. Mousseau, Board Counsel D. L. Schafer K. Eastlick, P.Eng. S. Lee, P. Eng.	

Mr. Bart van Schaayk, of KeySpan Energy Canada, registered at the opening of the hearing on March 20, 2001, in Sundre, Alberta, but did not present any evidence or participate in the proceeding. Neither Shell Canada Limited nor Husky Oil Operations was involved in the proceeding, although facilities belonging to them were discussed to some degree by participants.

1.3 Background

Appendix 1 provides an overview of the gas plants that were discussed during the course of the hearing. The information presented in the appendix is derived from the public record and the EUB's *Statistical Series 2001-50: Approved Gas Processing Plants in Alberta*.

2 ISSUES

The Board considers the issues respecting the applications to be

- need for the facilities,
- pipeline design, operation, and technical considerations of horizontal directional drilling,
- emergency response preparedness,
- pipeline routing options and relative impacts,
- public consultation, and
- the proposed sale of the NGGS and other matters.

3 NEED FOR THE FACILITIES

3.1 Views of the Applicants

Novagas and BP stated that the project would have a very significant, positive effect on the environment by reducing sulphur dioxide (SO₂), and nitrous oxide (NO_x) fugitive and flaring emissions. They noted that the proposed project would reduce maximum approved SO₂ emissions from 1744 to 224 tonnes per year and current approved NO_x emissions from 1134 to 926 tonnes per year relative to continued operation of the BP North and South Caroline plants. They further submitted that the project would also reduce noise levels for area residents living around the Caroline plants, some of whom initially objected to the project but subsequently withdrew their objections as their issues were resolved.

Novagas noted that the project proposed to convert two aging and grandfathered BP Caroline sour gas plants into sour gas compressor stations. Novagas stated that it would design the converted Caroline compressor stations to block in but not depressure in the event of power failures and would use gas recirculation to reduce flaring related to power outages. Novagas stated that it would develop and incorporate flaring restriction guidelines into operator training manuals for the modified Caroline facilities. The applicants said that they would complete operating procedures with written flaring guidelines before the modified North and South Caroline plants were turned over to any new operators.

BP said that current throughput was about 845 10³ m³ (30 million cubic feet per day [mmcf/d]) and 1130 10³ m³/d (40 mmcf/d) at the North and South Caroline plants respectively and that these rates were declining at 15 per cent per year. It said that turndown capabilities were about 25 per cent of capacity, or 526 10³ m³/d and 380 10³ m³/d at the North and South Caroline plants respectively. BP stated that remaining reserves of about 905 million (10⁶) m³ could be stranded when the plants reached those turndown limits. Given the limitations of the existing Caroline plants, it said that a conservation issue existed in that, unless something was done to produce the gas elsewhere or modify the plants, the gas reserves would be lost. BP noted that the project would result in the consolidation of at least two and potentially four gas plants (with the potential inclusion of the BP and Apache Garrington plants) into one recently upgraded facility. It noted that the benefits associated with consolidation would be achieved while providing acceptable economic returns to owners of the gas reserves.

Novagas stated that only minor changes would be required at its Harmattan gas plant and that the additional gas supply would extend the life of that plant to approximately 2020. It stated that it had completed upgrades to the plant in 1999 to comply with sulphur recovery guidelines for new facilities, thus increasing sulphur recovery at the Harmattan gas plant to 98.6 per cent. The plant had also been upgraded for efficient natural gas liquids (NGL) recovery, including ethane extraction. It said that the combined additional volumes from the BP Caroline plants plus the potential volumes from the Garrington plants would provide a combined stream of $2800 \times 10^3 \text{ m}^3/\text{d}$ (100 mmcf/d) to the Harmattan gas plant. It noted that the plant was operating at about 35 per cent of capacity and that without the gas the plant would reach its $2500 \times 10^3 \text{ m}^3/\text{d}$ (90 mmcf/d) turndown limit much sooner. Novagas stated that this would result in conservation issues for remaining reserves currently connected to the plant. It further noted that the project would result in lower unit operating costs for the Caroline gas, which, in turn, would result in fewer stranded reserves. Novagas stated that the NGGS pipeline would likely be used for other gas resources consistent with the orderly development of the area.

BP stated that the project responded to concerns that industry plan beyond incremental development with a comprehensive plan addressing a number of issues, including noise, air quality, and proliferation of sour gas facilities. It stated that it had contacted Shell and KeySpan directly for information needed in its assessment of alternatives and capacity availability. The applicants said that the Shell Caroline plant was operating at full capacity and would be doing so for at least the next four years. BP said that alternatives involving the modification of the Caroline plants and potentially connecting some of the gas to the KeySpan Strachan plant, while technically possible, would not address all the issues. It said that such alternatives would require significant expenditures for very few benefits.

BP said that options for processing the gas at either the KeySpan Strachan or Harmattan gas plants had the potential to address the needs of the gas reserve owners. It noted that while the capital associated with connecting to the Strachan system would be less, total gas transportation distances would be greater, with higher operating costs. BP said that the Strachan plant was designed to process gas with high H_2S content, while the Harmattan gas plant was designed to process gas with low H_2S content and thus would be more suited to handling the low- H_2S Caroline and the sweet Garrington gas streams. It stated that processing costs for the Caroline gas containing less than 1 per cent H_2S would be higher at Strachan and noted that there was an estimated \$10 million difference in the present value in favour of processing the gas at the Harmattan gas plant.

Novagas stated that gas reserves west of the proposed NGGS pipeline generally had higher H_2S concentrations, which could be accommodated at the Shell Caroline or Strachan gas plants but not at the Harmattan gas plant. It said that it did not make sense for the low- H_2S content gas from the BP Caroline plants to potentially displace higher H_2S content gas from those plants when Harmattan could process the low- H_2S volumes. It noted that although it did not have agreements to tie in gas currently processed at the Garrington gas plants, there would be a need to address the high carbon dioxide (CO_2) content of the Garrington sales gas by April 2002. Following that date the Garrington sales gas would require additional processing to meet sales gas CO_2 specifications, and it therefore made sense to provide for the tying in of the Garrington plants to the NGGS.

Novagas said that additional energy would be required relative to the proposed project to transport the raw gas to the KeySpan Strachan plant and then return the sales gas south through the Nova transmission system. It said that it had estimated $3.9 \times 10^6 \text{ m}^3$ (137 mmcf) per year in increased fuel gas use for the Strachan alternative based on pipeline system computer simulation evaluations. It also noted that the Harmattan gas plant recovered ethane and was connected to the Alberta Ethane Gathering System (AEGS).

Novagas stated that it would likely start up within six months once it had obtained approvals. It said that the existing sulphur recovery gas plant approvals for the North and South Caroline plants should remain in place for at least nine months from the date of the Board's decision to allow time for construction and start-up of the pipeline and modified facilities.

3.2 Views of the Interveners

The Bergmans, property owners of the southeast quarter of Section 2-33-4W5M, said that they endorsed the concept of closing down the Caroline plants in favour of an option that was more efficient, with less environmental impact. It was their position, however, that the applicants failed to demonstrate need and necessity for the proposed project. In that regard, they noted that the applicants had not demonstrated that use of other facilities with relatively minor modifications would not be capable of efficient and environmentally responsible processing of the gas with less capital cost and tremendously less impact on landowners. With respect to the applicants' claims that reserves would be stranded as plants reached turndown limits if the project did not proceed, the Bergmans stated that insufficient evidence was provided to substantiate the claims.

The Bergmans noted that the applicants did not provide any documentation from operators of alternative plants to support their conclusions on the capability to handle the North and South Caroline gas. They noted that KeySpan had indicated that it could take the gas with significantly less new pipeline and only small compressor additions and could process the gas to similar sulphur recovery levels. They stated that the alternative had significantly less capital cost and landowner impact.

The Bergmans stated that BP and Novagas provided insufficient evidence to support their claims that gas reserves would be lost (i.e., not produced) if the proposed project did not proceed.

Mr. Hermann agreed with the proposed changes to the Caroline plants but stated that he would like to see the least impact on the environment. He said he was concerned with the effects of pipeline setbacks on landowners. On that basis he said that he supported the KeySpan Strachan alternative.

Mr. Watson agreed with the rationalization of the Caroline plants, but he said that there was a need for more advanced planning involving the public in proposals such as the proposed project. He said that the EUB could play an important role in encouraging industry to cooperate to avoid proliferation and promote rationalization of facilities.

3.3 Views of the Board

The Board notes that a hearing with extensive cross-examination was required to effectively test the reasons and evidence for selecting one processing option over others. The Board further notes that prior to the hearing EUB staff, as well as the interveners, repeatedly requested information from the applicants regarding assessment of alternatives to the proposed project. These requests were responded to with limited, typically unsupported, claims of benefits. While the Board recognizes the constraint placed upon the applicants by confidentiality agreements, the Board continues to be of the opinion that the process to obtain basic information from the applicants on their evaluation of alternatives was unnecessarily complex and fundamentally counterproductive. However, notwithstanding its concerns related to information provided prior to the hearing, the Board is satisfied that the hearing process yielded sufficient information upon which it can make a fair and informed decision.

In situations where alternatives to a proposed project exist that may differ in impacts and potential benefits, the Board expects that applicants will undertake and provide an evaluation of alternatives. In making decisions based on such information, it is not necessarily the option with the least emissions or least surface impact or greatest economic value that would be viewed by the Board as in the public interest. Applicants must address proliferation and competitive project issues by providing complete and credible assessments of alternatives. Such information would include the following material:

- evidence that operators of existing sour gas facilities were formally contacted regarding capacity, feasibility, and costs of using existing facilities as alternatives to the proposed project
 - Related documentation should support the proponent's conclusions regarding capacities and feasibility of using/modifying the facilities.
- comparison of air emissions and energy use for alternatives
 - Air emissions of interest are SO₂, H₂S, NO_x, and hydrocarbon gases, as well as volumes of gas that would be routinely flared.
- comparison of environmental and public impacts associated with production, compression, and processing surface facilities, as well as related pipelines
 - Environmental impacts include a description of surface disturbances especially in environmentally sensitive or undisturbed natural areas.
 - Public impacts include a comparison of the size of EPZs, the number of people within EPZs, and the land area subjected to minimum setbacks (i.e., sterilized for development purposes).

In situations where applicants believe that economic considerations justify proposed projects despite alternatives with lesser impacts, the applicants must be prepared to substantiate the basis for the claimed economic benefits. While the Board typically does not delve into commercial arrangements, it expects that applicants will make information on capital, operating, and third-party facility costs available to support claims that economic benefit would justify the proposed course of action. Similarly, if applicants claim that a proposed course of action will provide greater resource recovery (or less stranding of reserves), the Board expects that information to be made available to substantiate the claims.

The Board finds that the consolidation of the supply systems of the North and South Carolina sour gas plants into an existing high sulphur recovery plant would result in fewer emissions, less flaring, and reduced overall public impact. Having carefully reviewed the evidence of the interveners, the Board believes that there was little dispute on that point.

The Board recognizes that both the Strachan and Harmattan options are feasible, with similar sulphur recoveries and emissions. The Board is further of the view that the Shell Caroline plant would not provide a timely option for processing the gas. In making its decision, therefore, the Board must weigh the incremental energy intensity and apparent economic disadvantage of the KeySpan Strachan alternative with the greater surface disturbance and landowner impact of the proposed project. In that regard, the Board accepts the applicants' evidence that the Strachan alternative would require greater overall pipeline transportation distances and consequently greater energy requirements for compression. The Board also notes that the Harmattan option results in lower energy requirements and operating fees, as well as higher NGL recoveries. Therefore, on the basis of process plant capabilities, air emission and noise issues, the Board believes that the applicants have demonstrated that processing the North and South Carolina plant gas at the Harmattan facilities is in the public interest.

With regard to the new flaring restriction procedures and guidelines to be developed by Novagas for the modified Caroline facilities, the Board expects the new procedures to be available for inspection at the request of Board staff prior to start-up of the modified Caroline plants.

4 PIPELINE DESIGN, OPERATION, AND TECHNICAL CONSIDERATION OF HORIZONTAL DIRECTIONAL DRILLING

4.1 Views of the Applicant (Novagas)

Novagas stated that based on the present compression available in the area, the main segment of the proposed pipeline would be able to transport approximately 100 mmcf/d of gas from the Caroline and Garrington fields to the Harmattan gas plant for processing; with additional compression at the appropriate location, the capacity could be increased to about 120 mmcf/d. Both BP and Novagas emphasized the importance of the timing of the approval of the project, stating that the minimum lead time to complete the project would be six months and that the transaction for this project would need to close by the end of the year.

Novagas indicated that because of the various design features of the proposed pipeline, the prospect of either a catastrophic failure or a low-level leak was extremely remote. It confirmed that the proposed pipeline would be designed for sour gas service and that it would be constructed, tested, and operated in accordance with CSA codes and the Pipeline Regulation.

To maintain the pipeline as a level-2 facility, Novagas proposed to license the pipeline for a maximum H₂S concentration of 25.0 mol/kmol (2.5 per cent) of natural gas. Novagas would use two independent systems at the South Carolina plant to control the H₂S concentration entering the pipeline going south to Harmattan; one would be to calculate the combined concentration of the outlet stream using measured inlet volumes and H₂S contents, and the other would be to monitor the combined outlet stream concentration using an H₂S analyzer. According to Novagas, the two control systems would operate concurrently and independently, and each would shut the sour gas stream down if the H₂S concentration exceeded the licensed limit. Novagas did not expect the H₂S concentration of the well fluids to change very often and believed that its monthly sampling of the inlet streams would ensure that the H₂S content remained within the approved levels.

Novagas indicated that the gas to be transported through the proposed NGGS pipeline would be modestly sour and would be dehydrated prior to entering the pipeline. Since the pipeline would only transport dehydrated gas, Novagas said that it would be subject to a very low potential of internal corrosion and hydrate formation and would, therefore, be able to offer a higher degree of safety in its operational life than would other pipelines transporting nondehydrated sour gas. Novagas stated that the dehydrator would be equipped with a dew point measurement device tied to a shutdown system that would be able to continuously monitor the dew point and shut the pipeline down during an operational upset. As a contingency measure, Novagas proposed the implementation of a batch inhibitor program, that would remove water and re-establish a protective film in the pipeline during a dehydrator malfunction. Novagas also proposed to include pigging facilities in the design that would be capable of accommodating internal inspection tools through the pipeline to detect corrosion. In addition, corrosion coupons would be installed within the pipeline to monitor corrosion rates, which would help determine when internal inspection should be conducted. Novagas further stated that the pipeline would be externally coated and cathodically protected from external corrosion by an impressed current.

Novagas proposed to install fail-safe emergency shutdown valves (ESDVs) along the pipeline with high- and low-pressure shutdown capabilities to achieve overpressure/underpressure protection, as well as line isolation, in the event of a failure. The ESDVs would be monitored by a supervisory control and data acquisition (SCADA) system and would be installed at strategic locations so that the entire pipeline system would be classified as a level-2 facility with potential release volumes not to exceed 2000 m³. Novagas suggested that the ESDVs should be installed at locations with easy access for maintenance and inspection and with a minimum spacing of about 1 km. Novagas was of the view that installing additional ESDVs near the Little Red Deer River crossing would create some access problems and would not result in any significant improvement in public safety.

Novagas considered potential pipeline events to be of very short duration. In the case of a full rupture due to a rapid pressure decline in the line segment, Novagas estimated that it would take about ten seconds for the ESDVs to close and isolate the line. Although Novagas agreed that small pipeline leaks would normally not result in a sufficient pressure drop to cause the ESDVs

to close, it believed that the likelihood of such a small leak in the proposed pipeline was slight due to the dehydrated nature of the gas. Novagas did not expect any gas leakage from ESDV sites, but confirmed that all ESDV shelters would be equipped with H₂S detectors, which upon detection of any gas leaks would alert operators at the South Carolina and Harmattan gas plant control rooms to initiate further investigation.

Novagas stated that the SCADA system would be monitored from the South Carolina and Harmattan gas plants, which would be manned 24 hours a day. The SCADA sites would be supported further by a battery backup system to ensure that SCADA control and monitoring would be maintained in the event of a local power failure. Novagas stated that all pipeline incidents, including leaks, would be reported to the Harmattan control centre. Upon receipt of a call or a SCADA alert, the on-site supervisor would assume control and assess the incident for the appropriate response; the response could vary from immediate ESDV closure for major failure to a longer response time for small leaks.

Novagas indicated that there were many leak detection models available on the market for the detection of gas leaks from pipelines. Although these models would not normally be able to provide an accurate prediction for low-level leaks, and their reaction time could range anywhere from minutes to half an hour, depending on the size of the leak, Novagas committed to further evaluate the reliability of these models and consider installation if an appropriate system to detect small leaks became available.

Novagas stated that it was committed to the safe and reliable operations of its facilities and would operate the pipeline in accordance with good safety practices, in the same manner as other Novagas facilities. It stated that it would conduct quarterly inspections, as well as monthly aerial inspections, on the pipeline right-of-way to monitor surface erosion, slope failures, right-of-way encroachments, and other construction activities or acts of vandalism along the route.

Novagas stated that all employees working in the Harmattan gas plant and in pipeline and field operations would receive training in facility operations, safety and emergency procedures, and working in a sour gas environment. Novagas also stated that records of the maintenance and inspection procedures for equipment purchased for the project, including ESDVs and other instruments, would be kept in a computerized maintenance and operation management system at the Harmattan plant. The plant manager would be immediately notified of any nonconformance found during its frequent facility inspections in order to initiate a proper response to deal with potential equipment malfunction.

Novagas proposed to cross the Little Red Deer River using horizontal directional drilling (HDD), a technique that would help minimize surface impact at river crossings. Because of access problems, Novagas did not conduct a geotechnical evaluation for the proposed crossing location on the Bergmans' property. However, a geotechnical assessment completed for an alternative location (the "jog" route) about 1 km to the east in the northwest quarter of Section 36-32-4 W5M suggested that the bedrock conditions in the area, mostly mudstone and sandstone, would be suitable for HDD. To help reduce the potential risk of fluid loss during the drilling operation of the river crossing, Novagas proposed that a minimum "no drill zone" of 8 m below the surveyed channel and active floodplain and a minimum setback of 50 m into the north valley wall be maintained. Although Novagas did not expect to see any major geotechnical difference at the proposed location, it agreed to complete a similar geotechnical evaluation for

the proposed location once it had permission to access the land. Novagas said that prior to drilling it would also have the contractor independently evaluate the feasibility of drilling the river crossing and assess the suitability of the proposed construction method and equipment, as recommended by the geotechnical report.

Novagas stated that a specialized external pipeline coating would be used for the river crossing segments. This coating, Novagas testified, would resist any scarring of the undercoating when the pipeline was being pulled through the drill segment. Novagas stated that prior to construction it would post warning signs near the Westward Ho camp and the Bible camps, and it would also notify local recreational groups about the construction. Novagas did not consider safety to be an issue, since drilling would only occur at a depth of 8 m below the bottom of the Little Red Deer River.

Novagas indicated that the geotechnical information it obtained from the alternative site suggested that the proposed Little Red Deer River crossing was well suited for drilling. Novagas believed that because of the layering shale and sandstone nature of the bedrock formation in the area, the probability of drilling fluid release during crossing the river would be low, probably less than 25 per cent. Novagas also stated that the drilling fluid circulation would be monitored by visual inspection, which would enable it to tell fairly quickly if there were any fluid losses due to significant fractures along the drill path.

Novagas stated that in its previous experience whenever it obtained the correct geotechnical information and had determined that it could drill, it had always been successful. Novagas said that a drilling contractor had made a general assessment of the Little Red Deer River crossing area and was of the opinion that proposed site would be a good location to drill. Novagas suggested that in the event that the drilling of any of the crossings was not successful, it would complete the crossing with an isolation method, either flume or dam and pump, either of which was routinely used in water crossing construction.

According to Novagas, the drilling fluid to be used in conjunction with its HDD would be an inert bentonite-water mixture with some smothering effect, which could result in mortality to fish in a confined area. However, Novagas believed that because the Little Red Deer River is a free-flowing river, the fish would likely vacate that particular area if there were a drilling fluid release. Novagas also confirmed that it had a contingency plan in place to deal with in-stream drilling fluid release that included information related to general inspection measures, water sampling equipment, cleanup procedures, and personnel contacts.

4.2 Views of the Interveners

Several landowners along the proposed pipeline route raised concerns about the pipeline for various reasons.

The Bergmans, landowners in the southeast quarter of Section 2-33-4 W5M, objected to the pipeline for reasons related to safety and limited capabilities of pipeline monitoring devices. They were concerned about the applicants' ability to confine the gas in the pipeline and were of the view that once this sour gas pipeline right-of-way was established, there would likely be more sour gas pipelines constructed in the area, thus imposing more negative impacts on their land.

Although the Bergmans were satisfied that the proposed pipeline met the material requirements of the CSA standards, they believed that the proposal did not contain sufficient details about the operation, inspection, maintenance, and monitoring of the proposed pipeline, especially with respect to monitoring low-level leaks. They stated that since the pipeline would cross a variety of terrain and soil conditions, it would be subject to frozen backfill, cold weather, and other less-than-ideal conditions, which could easily result in loss of coating system integrity and pipeline leaks. The Bergmans also expressed concerns about the limited capability of leak detection systems for detecting small leaks. Therefore, they stated that if the Board were to approve the application, they requested that the applicant be required to install a low-level leak detection system on the pipeline and to ensure that it was continually calibrated and maintained.

The Bergmans submitted that the Novagas conservation and reclamation report indicated some instability in the area, which might make it more difficult to directionally drill under the river. They considered the drilling fluid release probability of 25 per cent to be high and were concerned that any fluid released from the drill path would contaminate the river. They would not support the option of open trenching through their land near the river valley. In the event that directional drilling was not successful, they requested that the crossing location be moved elsewhere.

4.3 Views of the Board

Based on the evidence presented at the hearing, the Board is satisfied that the proposed pipeline meets the design and construction requirements of applicable CSA codes and the Pipeline Regulation. The Board notes Novagas's experience in constructing and operating sour gas pipelines in the province of Alberta and is convinced that continuous monitoring of the pipeline operation, coupled with the maintenance, inspection, and leak detection program proposed by Novagas, would ensure the continued integrity of the NGGS pipeline. The Board also accepts the blending mechanism proposed by Novagas and is satisfied that the pipeline would operate within the licensed H₂S limit.

The Board is of the view that the potential for internal corrosion within the pipeline is low because it would be transporting dehydrated gas. Further, the Board notes Novagas's commitment to monitor internal corrosion using corrosion coupons.¹ The Board is satisfied that the proposed corrosion-monitoring program, in conjunction with additional measures such as inhibition programs and pigging facilities, will adequately protect the proposed pipeline from internal corrosion. The Board concurs with Novagas that the prospect of either a catastrophic failure or a leak would be low. The Board acknowledges and approves of Novagas's commitment to continue to assess the reliability of leak detection models for small leaks and to consider installation when one becomes available.

The Board finds the ESDV locations selected by Novagas to be appropriate and believes that the ESDVs, in conjunction with the SCADA system, will promptly and effectively shut down and isolate the pipeline in the event of a major failure.

¹ These are small pieces of metal inserted into the pipeline system to determine corrosion rates. The coupons are subjected to the same conditions as the pipeline itself and are regularly monitored and analyzed.

The Board notes that the proposed pipeline route crosses five watercourses and that Novagas intends to use HDD techniques to cross the Red Deer River, the Little Red Deer River, and Eagle Creek. The Board notes that Novagas committed to directionally drill these three crossings and approves of that commitment. The Board appreciates that Novagas has accurate geo-technical information for the Red Deer River and the Eagle Creek crossings and is satisfied that these watercourses are good candidates for the successful application of HDD techniques.

Based upon the evidence before it, the Board is of the view that the likelihood of an in-stream release at any of the water crossings is low. In the event that such a release occurs, however, the Board is satisfied that the precautions and contingency plans proposed by Novagas are appropriate in the circumstances.

In regard to the proposed HDD of the Little Red Deer River the Board notes that Novagas stated that it would consider drilling the Bergmans' entire quarter section, not just the river portion. The Board appreciates the concerns expressed by the Bergmans about the potential surface impact of the proposed pipeline to their property. The Board recognizes these concerns as legitimate and is very cognizant that the pipeline will cross a designated environmentally sensitive/significant area. As such, the Board is of the opinion that the impact of the pipeline's construction on the property must be mitigated to the greatest possible degree in this unique situation. The Board therefore requires, as a condition of its approval, that the Bergmans' entire quarter section be traversed using HDD techniques or a combination of HDD and boring techniques, unless Novagas can demonstrate, to the satisfaction of the Board, that it is technically not possible to do so. Further, as an additional condition, if the entire section cannot be crossed using the techniques described above, Novagas must use trenching or isolation techniques that result in minimum disruption to the Bergmans' property.

In the event that it is determined that the pipeline must be installed by trenching, the Board strongly suggests that Novagas, the Bergmans, the Foran-Sheddens, and the Aeblys discuss the possibility of shifting the pipeline right-of-way closer to the western boundary of the Bergmans' quarter section property line so as to reduce the impact upon treed portions of the property.

5 EMERGENCY RESPONSE PREPAREDNESS

5.1 Views of the Applicant

Should the applications be approved, Novagas said that the current emergency response plans (ERPs) for the Harmattan gas plant, the associated Mobil pipelines, the North and South Caroline gas plants, and their associated pipeline gathering systems would all be integrated into one seamless new ERP that would include the existing plants, the existing pipelines, and the proposed NGGS pipeline. Novagas submitted a draft ERP for its entire NGGS project to the EUB and forwarded revisions to the plan in February 2001 and again in April 2001. A basic representation of the EPZ area in the ERP for the entire NGGS project is shown on Figure 2.

With respect to its ERP, Novagas said that it had formal mutual aid arrangements with BP and Mobil. Further, it stated that all the operators in the area had a relationship with the Sundre Petroleum Operators Group (SPOG). Novagas noted that it was its clear objective to cooperate with other area operators on emergency planning issues through mutual aid agreements.

Novagas said that it met with the appropriate municipalities to discuss its draft NGGS ERP. It noted that in its draft ERP it identified the external resource agencies and their contact numbers. It stated, however, that typically in an emergency those external services would not enter the hazard zone but rather would provide support under the control of the operator.

Novagas said that it made several efforts to contact all of the residents in its EPZ but was unable to make direct contact with some of the residents in seasonally occupied dwellings. Novagas stated that if its project were approved, it would revisit all of the residences in the EPZ and provide the residents with updates on its ERP and a more detailed letter outlining its proposed automated telephone notification communication system. In addition, Novagas stated that it would revisit the entire planning zone to update its current data.

Novagas stated that its ERP was very detailed and responsive. Novagas conceded, however, that it had identified a number of additional planning measures that it must undertake to ensure that the ERP comprehensively addressed area residents. Novagas noted that it would have to consider commercial users of the Little Red Deer River, such as rafting companies. It also noted that it would need to notify campground operators of its ERP and request permission to post information signs. Novagas said that it would erect signs along the Little Red Deer River system indicating that there was a sour gas pipeline crossing. In addition, Novagas stated that it would hold an open house in the community to allow residents an opportunity to review its ERP planning and provide input, so that their knowledge could be integrated into the ERP. Novagas noted that it would also use the open house to explain its proposed safety devices on the pipeline, such as ESDVs, and to show how personal H₂S detectors function and explain how air monitoring would be deployed.

Novagas said that its proposed pipeline route, including the location of its ESDVs, appropriately accounted for the location of potentially high populations. It noted that the ERP and associated EPZ for the proposed route was intentionally designed to ensure that Westward Ho, located to the west of the Bergmans' property, and the Harmattan Bible camps, located to the east, were not inside the EPZ. It said that if there was a guillotine rupture of the pipeline, its ERP was set up to be extremely responsive to an in-shelter command, and that this command was optimal for residents inhabiting fixed structures. It said that it would be undesirable to include the above camps in the EPZ, as there would be temporary structures such as tents, which would not provide sufficient shelter. Novagas also noted that it had been in contact with the camps regarding its project and ERP and that it would continue to keep them informed. Novagas said that its ERP had an emergency hazard area and a notification area and that it had carried the camps in the notification area and would notify and assist them in the event of an emergency.

Novagas said that it would continue to evaluate, refine, and improve its seamless ERP for the NGGS project and that it was aware that its final plan would have to be submitted to the EUB for final review and approval.

Novagas rejected the Bergmans' position that a risk assessment would be helpful in planning for pipeline contingencies and refused to commit to performing a risk assessment. Novagas stated that a risk assessment could create other areas of uncertainty, since the methodology of risk assessment had not been standardized.

5.2 Views of the Interveners

With respect to the ERP, the Bergmans noted Novagas's position that a risk assessment would not benefit the project. The Bergmans said that a risk assessment would have been useful in determining if the ERP was adequate and accurate. They said that Novagas should have taken the responsibility to ensure that the two camps and Westward Ho were included in the ERP. The Bergmans argued that Novagas proposed to install ESDVs on the south side of the Little Red Deer River and on the north side of their property so as to avoid having to include Westward Ho and the camps in the ERP. The Bergmans stated that if there were a pipeline leak or a valve leak on the north side of their property, they would have to egress towards the leak zone and EPZ on a road that leads to the north. The Bergmans expressed serious concern with that approach, particularly since a risk assessment had not been completed on the project. The Bergmans also felt that in the event of a pipeline leak or rupture, egress would be difficult because of the terrain conditions in the area.

The Bergmans stated that if the Board were to approve the application, the applicant should be required to include Westward Ho and the Bible camps in the ERP. The Bergmans did not believe that the nature and level of activities in the Little Red Deer River valley had been fully assessed by the applicants. The Bergmans said that there was considerable recreational activity, including hiking, boating, fishing, and snowmobiling, in the river valley and it was important to understand the level of risk that the proposed pipeline may have on the area. The Bergmans raised the concern of how these individuals were to be notified in the event of an emergency situation with respect to the pipeline and they noted the ineffectiveness of cell phone operation in the immediate area of their property. Therefore, if the Board were to approve the application, the Bergmans requested that the applicant be required to complete a risk assessment, as well as an assessment of the activities for the area around the Little Red Deer River valley where the proposed NGGS pipeline would cross.

Mr. Bergman expressed his personal concern that his sense of smell was poor and that he wanted to know what operation and monitoring programs Novagas would have in place. He noted that when small leaks occurred, local residents were usually the first to smell it and alert the company to the problem and that he lacked this early warning system that others have through their sense of smell.

5.3 Views of the Board

The Board accepts that the ERP submitted by Novagas was in a draft form and that the ERP would be subject to further input, refinement, and improvements prior to final review and Board approval. The Board notes Novagas's commitment to continue to evaluate, refine, and improve its ERP for the entire NGGS project and that this process will continue to include input from the public.

In addition, the Board notes that there are already comprehensive ERPs in place for a large part of these existing operations, such as for the North and South Carolina plants, the Harmattan gas plant, and associated pipeline gathering systems. The Board believes that this should assist Novagas in merging existing plans into one comprehensive, seamless plan for the NGGS project that would address emergency response issues effectively. The Board also notes that the existing facilities will continue to operate under their current ERPs during construction of the proposed

NGGS pipeline. The Board emphasizes, however, that the NGGS cannot be operated until its new ERP has been fully assessed and approved by the EUB. It is the Board's view that the ERP will not be considered complete until a comprehensive study of the recreational use of the Little Red Deer River crossing area is performed and appropriate protective measures are incorporated into the ERP. The Board therefore requires, as a condition of its approval, that Novagas complete and submit its recreational study of the Little Red River crossing area to the Board, accompanied by the appropriate adjustments to its ERP.

The Board notes Novagas's commitment to continue its consultation process with respect to its ERP planning process and to ensure that parties it was unable to contact are visited and the appropriate information is exchanged. The Board further notes that Novagas encountered difficulties in contacting some of the seasonal residents; the Board will require that this contact be fulfilled and that all personal information be obtained in order to complete the NGGS project ERP.

As outlined in EUB *Interim Directive (ID) 2000-8: Revised Guide 56: Energy Development Application Guide*, the EUB requires that a proponent disclose its ERPs in its preapplication consultation. This should include all development issues and potential impacts. For site-specific ERPs, this should include

- a party's inclusion/exclusion in the ERP,
- the potential impacts to parties in the plan, and
- how concerns will be addressed.

The Board recognizes that the subject applications were filed prior to the release of *ID 2000-8* and the revised *Guide 56*. However, the Board emphasizes that where a site-specific ERP is required, ERP information must be fully disclosed with potentially affected parties during project planning and before an application is made. In this particular situation the Board cautions Novagas that it must address concerns that arise through its continued public consultation efforts with respect to its ERP. Should any concerns remain unresolved, this must be disclosed to the Board and it will decide how to proceed.

The Board acknowledges the Bergmans' request for a risk assessment and Novagas's response to that request. The Board notes that although risk assessment may be a useful tool in making effective choices among risk-reduction measures or in assigning priorities among pipeline inspection, monitoring, and maintenance activities, it is not a mandatory requirement for pipeline applications. The Board normally would require a risk assessment for the purpose of comparing alternative proposals, for situations that would involve public safety in highly populated areas, or where pipeline encroachment could result in increased risk.

The Board is satisfied that the proposed pipeline is properly designed to transport sour gas and, due to the dehydrated nature of the gas and the additional corrosion control and monitoring measures proposed by Novagas, that the potential for a pipeline corrosion failure is low. The Board notes that the area near the Bergmans' land where the proposed pipeline traverses is not a highly populated. Furthermore, the Board heard no evidence suggesting that the proposed pipeline would be subject to any significant encroachment activities. The Board is satisfied that the ESDVs along the proposed pipeline, in conjunction with the procedures contained in the ERP, will enable Novagas to properly deal with the unlikely occurrence of a pipeline failure.

Based upon the foregoing, the Board is satisfied that there is no compelling need to require Novagas to complete a risk assessment for the pipeline.

The Board is not convinced that baseline ambient air quality monitoring, as requested by the Bergmans, is necessary under the circumstances. In that regard, the Board notes that there would be no routine emissions from the proposed pipeline in the vicinity of the Bergmans' lands. Based upon its review of the entire record, the Board is satisfied that the potential for a line failure is remote given the pipeline's proposed design. In addition, the Board is also satisfied that the leak detection and mitigation process to be implemented by the applicant will prevent pipeline emissions from degrading air quality in the area. Based upon the foregoing, the Board also finds that it is unnecessary for Novagas to install and maintain H₂S monitors and alarms on the Bergmans' lands, the Harmattan camps, and at Westward Ho.

6 PIPELINE ROUTING OPTIONS AND RELATIVE IMPACTS

6.1 Views of the Applicant

Novagas stated that it initially considered four potential pipeline routes linking the North and South Carolina plants with the existing Harmattan gas plant. The Novagas application also contemplated pipeline routing to tie in the two Garrington plants should Novagas establish commercial agreements with their owners. Novagas emphasized that it would not connect the two Garrington plants to the NGGS pipeline until such time as commercial arrangements were finalized.

The routes considered by Novagas are shown on the attached Figure 2 and are as follows (from east to west):

- 1) The Blue route would begin at the North Carolina plant and then follow the proposed NGGS route to the South Carolina plant. It would proceed to tie in the Garrington plants and then travel south to the Harmattan gas plant.
- 2) The Red route (proposed NGGS pipeline) would begin at the North Carolina plant, follow the proposed NGGS route to the South Carolina plant, and then travel south to the Harmattan gas plant. A lateral line from the east would tie in the two Garrington plants.
- 3) The Nova route would primarily follow the existing Nova transmission system from the North Carolina plant to the Harmattan gas plant. A lateral line from the northeast would tie in the South Carolina plant. The Garrington plants would be tied in via the Blue route to the South Carolina plant.
- 4) The Sulphur route would roughly parallel the existing Shell sulphur line. This route would be used in combination with the other routes described above to tie in the plants to the Harmattan gas plant.

Novagas stated that its initial selection of the above routes was based upon a review of topographic maps, aerial photos, and existing information on linear corridors for the project area. Novagas indicated that aerial and ground reconnaissance were then used to further assess routing options.

Novagas said that it rejected both the Nova and the Sulphur routes because they were longer than the Red and the Blue routes, they would be located in closer proximity to populated areas and they crossed environmentally sensitive areas, such as the Snakes Head Natural Area and because of the greater distance from the two Garrington plants, the necessity for additional river crossings, and their overall cost.

Novagas further said that it rejected the Blue route because it was longer than the Red route, it tied in the two Garrington plants prematurely, it required the inclusion of the Harmattan camps in its EPZ, and it was less economic than the Red route.

Novagas stated that the Red route was its preferred route and was the only route it had applied for. Novagas cited the following reasons for its selection:

- It was the shortest, most direct route between the desired control points.
- It avoided populated areas.
- It removed the Westward Ho and Harmattan Camps from the EPZ.
- It allowed for connection to the two Garrington plants at a later date but did not require extra pipeline in case the Garrington plants were not brought on line.
- It was the most economical option.

Novagas stated that given its preference to avoid the inclusion of the Westward Ho and Harmattan camps in the EPZ, it was necessary to route the pipeline through the Bergmans' property. Novagas stated that it considered, and then later rejected, the alternative jog route, which would circumvent the Bergmans' property. The jog route is shown on Figure 1.

Novagas said that it rejected the jog route because it was longer than the Red route, required the inclusion of Westward Ho in the EPZ, affected more residents, and was more costly. Novagas conceded, however, that the addition of an ESDV on the jog route would remove Westward Ho from the EPZ.

At the request of EUB staff, Novagas prepared a comparative analysis of the relative impacts of the Blue route, the Red route, and the jog route. Novagas stated that if it were to use the same number of ESDVs on all three routes, the EPZ for the Blue route would be 23 per cent larger than the Red route. Novagas submitted that for the Blue route it would be necessary to include the Harmattan camps in the EPZ and that for the jog route, it would be necessary to include Westward Ho in the EPZ. Novagas conceded, however, that these areas could be removed from the EPZ by the use of additional ESDVs. Novagas noted that both the Blue route and the jog route would require greater use of 12 inch (323.9 mm) pipeline, thus resulting in more H₂S

within the pipeline segments. As a result of its analysis, Novagas concluded that the comparative impacts of the three routes were similar, although it would be more costly to proceed along the Blue and jog routes.

Novagas acknowledged that its proposed crossing of the Little Red Deer River would require construction in a regional Environmentally Sensitive/Significant Area (ESA). Novagas noted that the site is a key area for white-tailed and mule deer, an important fishery area, and a diverse bird-breeding habitat. Novagas stated that it provided a copy of its proposed route and its conservation and reclamation report to Alberta Environment (AENV) and the appropriate provincial and regional authorities, including the County of Mountainview, which designated the area as an ESA. Novagas said that none of these authorities expressed concern about the pipeline routing through the ESA.

Novagas stated that the proposed pipeline would have a minimal impact on the Bergmans' property because of the construction techniques proposed. Furthermore, Novagas testified that the entry and exit points for the Little Red Deer River crossing would be located on land currently used for agriculture and, as a result, the impact on wildlife habitat would be minimal. Novagas testified that it intended to drill the pipeline from either bank of the Little Red Deer River but it had yet to determine which property the drilling would be initiated from. Novagas stated that this decision would be made after it had an opportunity to survey and assess the Bergmans' property.

Novagas conceded that difficulties might arise with completing the drill to the surface if the drill bit encountered gravel near its exit point. Should such a situation arise, Novagas stated, it may be necessary to excavate down to the drill bit to a minimum depth of 6 to 8 feet. Novagas testified, however, that such problems could largely be avoided if a comprehensive assessment of the proposed site were completed prior to drilling.

Novagas stated that it was aware of the Bergmans' concerns about the impact of the pipeline on their property. Novagas submitted that it would consider, but not commit to, directionally drilling the entire extent of the Bergmans' property. Should it decide not to drill the entire property, Novagas stated, it would employ construction techniques that would minimally impact the treed portion of the property.

Novagas said that its preferred construction period would be in the spring and summer. It stated that it would like to avoid construction during the fall to minimize the impact upon the fall harvest and to avoid the winter because of the additional impact and costs associated with winter construction. Finally, Novagas stated that it would not commence the HDD of the Little Red Deer River during the late winter because the area was heavily used by deer then.

Novagas pointed out that it had received no objections to the proposed pipeline right-of-way other than from the Bergmans, the Foran-Sheddens, the Aebelis, and Mr. Pearson.

Novagas did not believe that there would be a major noise concern associated with the proposed drilling; however, it agreed to talk to local residents about noise impacts and their requirements in the event that drilling continued at night.

6.2 Views of the Interveners

The Bergmans, Foran-Sheddens, and Aebli submitted that if the Board determined the overall project to be in the public interest, it should require the applicants to find a more appropriate route for the pipeline. These interveners argued that the route chosen failed to minimize disturbance by using existing rights-of-way and pipeline corridors. It was their position that the Blue route would be a better choice for the pipeline because it shadowed existing corridors and rights-of-way for 90 per cent of its course. The interveners pointed out that the Red route, by comparison, uses existing corridors for only 40 per cent of its route. These interveners stated that, in their experience, the highest volume of summer river traffic was directly through the EPZ, and that by using the Blue route, and thus a more easterly crossing, the risk to those users would be significantly reduced. These interveners also pointed out that by using the Blue route the applicants would avoid unnecessary disturbance to land designated as environmentally sensitive.

The Bergmans stated that they purchased their property in 1991 with the express intention of building a retirement residence thereon. They indicated that while they currently did not reside on the property, they did farm a portion of it and had established a machine shed on the land. The Bergmans also expressed concern about the impact of the pipeline on the value of their property. They stated that it was their future intention to subdivide the property so that it could be passed on to their three sons. The Bergmans submitted that the pipeline setback would greatly interfere with their plans to subdivide.

The Bergmans stated that their property frequently hosted a wide variety of wildlife. They noted that deer, moose, elk, black bear, fox, owl, and coyote had all been sighted in the area. The Bergmans expressed concern about the impact of the pipeline on these creatures, both in terms of disturbance caused by its construction and of possible health effects should a leak occur.

The Bergmans further indicated that if the drilling were to go through the aquifer, which, according to their well log, would likely be intersected by the proposed drill path, any drilling fluid release would potentially contaminate the aquifer. They stated that should the applied-for pipeline be approved, they would like assurances from the applicants that any water problems would be addressed immediately. With respect to potential contamination to the water aquifer, they requested that if the Board were to approve the application, the applicant be required to complete a baseline water quality analysis and to establish a monitoring system at their places so that the water quality could be continuously monitored. The Bergmans were also concerned about disruption to the fields in general and requested that if the Board approved the application, their entire quarter section be directionally drilled.

The Bergmans expressed some concern about a possible increase in air emissions in the Harmattan area. Dr. Bergman expressed concerns about the toxic nature of H₂S and testified that she performed a limited literature review and spoke with regional experts on the subject. Dr. Bergman stated that while she is not an H₂S expert or an expert in toxicity, she was able to draw the following conclusions from her review:

- Evidence is mounting that H₂S is more toxic than previously thought.
- There is no known safe level of H₂S exposure.

- There is an agreed-upon lack of research about the effects of H₂S.
- Monitoring of H₂S levels in the community is not done in an organized way.

The Bergmans submitted that if the Board was inclined to grant the applications, a comprehensive assessment of the social and environmental impacts of the proposed project should be performed prior to its approval. The Bergmans further suggested that the Board require the applicants to perform a risk assessment. Additionally, they felt that the applicants should develop a comprehensive, proactive remediation plan that would require the applicants to address any problems experienced by landowners that appeared to arise from their activities.

The Foran-Sheddens and Aebli, landowners in the southwest quarter of Section 2-33-4W5M, also voiced their opposition to the project. They testified that their property had been passed on to them by their grandfather, the late Dr. Grant MacEwan, and submitted that the proposed project was contrary to the environmental ideals instilled in them by Dr. MacEwan. They stated that the prospect of sour gas development in the Little Red Deer River Valley threatened the integrity of an environmentally sensitive area. They also expressed concerns about raising their children in close proximity to a sour gas pipeline.

The Foran-Sheddens and Aebli stated that the proposed pipeline would not result in any net profit to the environment, the people of Alberta, or the people along the proposed pipeline route. They suggested that the pipeline should cross the Little Red Deer River at a place where pipelines already existed and should avoid disturbing a relatively pristine area of the river valley. They were concerned that their ability to use and enjoy their property would be severely undermined by the proposed routing of the pipeline.

The Bergmans, Foran-Sheddens, and Aebli submitted that Novagas had not demonstrated the need for the proposed pipeline and that construction of the pipeline would constitute an unreasonable and unnecessary proliferation of pipelines. They stated that the proposed pipeline would result in serious health, safety, environmental, and water quality impacts.

The Bergmans requested the Board to withhold approval of the portion of the pipeline on their land and in the Little Red Deer River valley until Novagas could provide appropriate information to assess the risks and the nature of the impacts on the area.

The Bergmans, Foran-Sheddens, and Aebli stated that should the Board approve the applications, they would like the Board to include the following conditions as part of its approval:

- The Bergmans' entire quarter section must be directionally drilled to minimize disturbance.
- There would be no open trenching of any of the water crossings.
- The applicants must perform a baseline water quality analysis and follow up with further testing following drilling.

- The applicants must perform a risk assessment for that portion of the pipeline that crosses the Little Red Deer River.
- The applicants must consider the Westward Ho facilities and the Harmattan Bible camps to a greater degree in their ERP.
- The applicants must carry out a comprehensive study of recreation activities related to the Little Red Deer River.
- The applicants must install H₂S monitors and alarms on the Bergman and the Foran-Shedden and Aebli lands and at Westward Ho and the Harmattan camps.
- The proposed transfer of the subject facilities must be subject to public review and scrutiny.
- The applicants must carry out baseline air quality studies to ensure that air quality is not affected by its facilities.
- The applicants must install a low-level leak detection system that is regularly maintained and calibrated.

Mr. Watson, a landowner in the west quarter of Section 3-34-4W5M, stated that the proposed pipeline crossed his land. Mr. Watson supported the applications and did not object to the pipeline crossing his property. He did raise some concerns about the routing across his lands but indicated that the problems identified could not be avoided. Mr. Watson conceded that his primary concern was that of compensation and acknowledged that the Board did not have the jurisdiction to consider that issue. Mr. Watson expressed his intention to pursue this issue with the Alberta Surface Rights Board.

Mr. Hermann acknowledged that the proposed pipeline would not cross his property and they registered no specific objections to the pipeline.

Mr. Pearson, the landowner of the northeast quarter of Section 2-33-4W5M, stated that he signed an agreement allowing Novagas to construct the proposed pipeline on his property shortly before he underwent heart surgery and said he was not thinking clearly at the time. Mr. Pearson submitted that one of the factors he considered when he purchased his property was that there was no oil and gas development on it. He suggested that the proposed pipeline would devalue his land and stated that when he carefully considered the implications of having the pipeline cross his property, he felt compelled to withdraw his consent to the application. Mr. Pearson stated that he was in the process of having his property certified for producing organic meat and vegetables and that he was unsure how the presence of the pipeline would affect these plans.

6.3 Views of the Board

The Board recognizes that a proposed facility may have impacts upon the owners and occupants of lands affected by a proposed project. It is the Board's position that the proponent of such a project has the duty to provide, in a timely manner, affected parties with the information necessary to fully appreciate the impacts of the project upon their interests. An affected party has

the right to thoroughly understand why it is that his or her property could be host to such a facility, and it is up to the applicant to ensure that this is explained to that party's satisfaction.

The Board finds that in this situation additional comprehensive information could have been provided to the Bergmans, Foran-Sheddens, and Aeblis with regard to routing alternatives and the route selection process. In the Board's opinion, Novagas's decision to provide limited information in a piecemeal fashion fostered an atmosphere of uncertainty and distrust, which likely contributed to a longer and more acrimonious process.

The Board encourages applicants to consider alternative pipeline routing options prior to making application. While in the present case the Board notes that Novagas ultimately selected a single preferred route in its application, it recognizes that the route selection process did take into consideration a number of different alternatives. The Board finds that the criteria used by Novagas to reject the Nova and the Sulphur routes, such as the need to avoid highly populated areas and the need to reduce environmental impacts by avoiding unnecessary river crossings, were reasonable and appropriate.

With regard to the selection of the Red route over the Blue route, the Board finds, based upon its review of the entire record, that both provide a viable option for the routing of the proposed pipeline. The Board appreciates that the Blue route tracks existing corridors and rights-of-way for the majority of its course and would not involve crossing the Little Red Deer River at an ESA. The Board also notes, however, that the Red route is shorter and keeps Westward Ho and the Harmattan camps out of the EPZ, while the Blue route prematurely connects the two Garrington plants.

It is the Board's position that the low level of relative risk associated with each route is comparable provided that Novagas takes the same mitigative measures on the Blue route as it proposes on the Red route. The Board notes, however, that the Blue route would require more 12-inch pipeline and would result in more H₂S within the pipeline segments.

While both routes have obvious advantages and disadvantages, the Board finds that the Blue route is not clearly superior to the route applied for. In that regard, the Board finds that the environmental impacts of the two routes, including the number of watercourse crossings, are comparable, and that these impacts are within acceptable limits. As noted in Section 4.3, it is the Board's view that the pipeline as proposed can be constructed and operated safely. Further, as discussed in Section 5.3, the Board is satisfied that once Novagas has contacted all residents within the EPZ, it should be able to successfully complete and implement an effective ERP for the Red route. The Board is also cognizant of the applicants' position that the Blue route was not applied for, and that it is only the Red route that the Board should consider. Based upon the foregoing, the Board finds that the Red route as applied for acceptably addresses issues of environmental impacts and public safety and shall therefore be approved, subject to the conditions detailed earlier and listed in full in Appendix 2.

The Board is cognizant that the Red route crosses the Little Red Deer River at an ESA. Given the Board's decision to require Novagas to directionally drill or directionally drill and bore the Bergmans' entire quarter section if technically possible as a condition of its approval, the Board

is comfortable that the impact on the ESA will be minimal. Further, the Board notes that both AENV and the County of Mountainview reviewed the Red route and raised no objections to the proposal. The Board is also mindful of Novagas's commitment to avoid any drilling or construction activities on the Bergmans' property during the late winter, when the area is subject to greater use by local area wildlife.

The Board also appreciates the Bergmans' concerns with regard to their water well. The Board notes in that regard that Novagas committed to perform baseline water quality analysis upon their well and the well of the Foran-Sheddens. The Board expects that should the Bergmans or any other resident along the NGGS route experience water problems that are likely linked to the construction or operation of the NGGS, Novagas would immediately address the problem and not delay to determine the exact source of the problem.

With respect to the Bergmans' request for certain conditions of approval and Novagas's response to those conditions, the conditions incorporated into this approval are listed in full in Appendix 2. The conditions requested by the Bergmans that have not been included in Appendix 2 are addressed elsewhere in this report.

7 PUBLIC CONSULTATION

7.1 Views of the Applicant

Novagas said that it engaged in an extensive public notification and consultation process prior to the hearing and acted throughout in accordance with EUB guidelines and good industry practices. It said that it examined several different pipeline routes and was unable to find a reasonable route free of local landowner opposition. It said that it had also attempted to address the outstanding objections as best it could.

In its application material, Novagas reflected that its consultation process consisted of

- distribution of information packages in April and June 2000 to landowners within 3.5 km on both sides of the proposed NGGS pipeline route, impacted industry, community groups, local officials, and regulatory agencies; and
- personal consultation with landowners within 0.5 km of the pipeline route, advertising in local newspapers, four public open house information sessions, and meetings with interested landowners, individuals, community groups, local officials, and industry stakeholders.

Novagas noted that it had resolved a number of concerns raised by area residents who lived around the South Caroline gas plant and that it had been in receipt of a number of letters in support of its project from other industry stakeholders. In addition, it noted that it had also obtained over 90 per cent of the right-of-way agreements with all landowners.

7.2 Views of the Interveners

The Bergmans said that the process of public consultation with Novagas first started in April 2000 when they were contacted by the company's land agent, who requested permission to

survey their farm. The Bergmans stated that the land agent was not forthcoming with information about the proposed project was unable to appropriately answer their questions about it. The Bergmans then chose to seek information directly from Novagas and forwarded an information request to Novagas on May 1, 2000.

The Bergmans reported that their subsequent meetings with representatives from Novagas gave rise to further frustration. They stated that Novagas was unable to provide concrete answers to their questions about health and safety issues associated with the pipeline. They also testified that Novagas advised them constantly that this was a very good economic decision for the company and that it was necessary for them to consent, as they were one of the last parties to be contacted. Novagas emphasized to the Bergmans that over 80 per cent of the landowners had already consented.

The Bergmans stated that Novagas frequently changed the pipeline's route across their property, often without consultation with them. They noted that they continued to deny Novagas permission to enter their lands for geological testing and surveying but acknowledged that they did allow one staff member from Novagas to walk the land and have a look at the property.

The Bergmans stated that they attended two open house meetings regarding the project. They said that at the second open house in late June 2000 they were shown another map that illustrated that the pipeline would not cross their property but would follow a route, which later came to be known as the jog route. It was at this point that they learned that their neighbours, the Foran-Sheddens and Aebli, had also been approached by Novagas in the same fashion and experienced some of the same frustrations. They said that they then decided to take a collaborative approach with the Foran-Sheddens and Aebli in dealing with the application.

The Bergmans stated that they continued to make every effort to understand the application and the reasons why the pipeline had to cross their land. The Bergmans testified, however, that they received very little cooperation from the applicants and were often told that they would not be able to understand much of the information they sought. The Bergmans also noted that they were then told that the NGGS pipeline would enable Novagas to sell its Harmattan gas plant. The Bergmans said that they believed that this was the fundamental driver behind the NGGS project and they noted that Novagas challenged them to find a better alternative pipeline route.

The Bergmans stated that they found the process of public consultation with Novagas to be extremely frustrating and time consuming. They said that none of the information about pipeline route selection and alternatives had been forthcoming until very late in the process and that they were often blocked by claims of confidentiality and secrecy, which concerned them. They felt that Novagas and BP should have been up front about their consideration of alternatives for the NGGS project when the consultation process began.

7.3 Views of the Board

The Board acknowledges that Novagas's public consultation program generally complied with the spirit and intent of the EUB's guidelines. The Board also notes that Novagas was successful in resolving a number of objections and that it was able to obtain over 90 per cent of the right-of-way agreements with landowners along the proposed NGGS pipeline route.

However, the Board remains concerned with the following two specific matters:

- In the initial contact with the Bergmans, the land agent was not able to tell them any particulars about the project, and
- Novagas was not forthcoming with detailed information about its project and alternatives when it was being requested of them.

As stated in Section 6.3, the Board expects applicants to supply to directly and adversely affected parties sufficient information about proposed projects to ensure that each party can fully understand the scope and nature of the project, the potential impacts of the project, and how the applicant will address those impacts. The Board is extremely disappointed that detailed information was only provided after many requests from the Bergmans and the Board.

8 THE PROPOSED SALE OF THE NGGS AND OTHER MATTERS

8.1 Views of the Applicants

The applicants stated they intended to make the NGGS operational in three phases. The first would involve obtaining and implementing the necessary approvals to modify the Harmattan gas plant, convert the North and South Caroline plants to compressor stations, and construct and operate the NGGS pipeline. The second phase would address the transfer of ownership and the change in operators for the facilities, including the transfer of the two Caroline plants from BP to Novagas. The third phase would deal with the completion and submission of a reclamation and decommissioning plan to AENV for its review and approval. Novagas said that within six months of assuming operatorship of the Caroline plants, it must submit its plan to AENV. Novagas noted that it could not start decommissioning activities until the plan was approved by AENV and it said that the decommissioning process would take place over time.

Novagas clearly stated its intention to sell the entire NGGS in the near future. It admitted that it would consider selling the system even before construction began and stated that it would include any commitments made in respect of this application as conditions of future sales agreements. Further, BP stated that it integrated into its agreement with Novagas performance standards that would carry forward to any new owner of the facility. Novagas acknowledged this provision.

Novagas indicated that its current operations included a number of proactive safety measures, including corrosion monitoring and documenting incidents. It stated that all such records were stored at the Harmattan plant and would be included in the anticipated transfer and that it assumed the new operator would continue to operate these programs and maintain the records. Novagas also stated that the experience of the employees at the Harmattan plant would carry through the transfer but could not say if the current employees would stay with the plant.

Novagas stated that the Caroline plants would continue to operate during the construction phase to convert the plants to the compressor stations while the NGGS pipeline was being constructed and changes were being made to the Harmattan plant. Novagas stated that it would then shut down the Caroline plants to complete the pipeline tie-ins and valve modifications necessary to

operate the Caroline plants as compressor stations. It said that it would then start up the NGGS system in the new mode and start feeding gas into the new pipeline system to the existing Harmattan gas plant.

In response to the Bergmans' request that any transfers of the NGGS facilities be conducted under public scrutiny, Novagas indicated that the Board's transfer process should satisfy these concerns.

8.2 Views of the Interveners

The Bergmans expressed concerns about the future operations of the NGGS system. They were concerned about the potential transfer of ownership of the Harmattan gas plant and associated facilities, which may result in different corporate approaches to issues, operations and decision-making; therefore, if the Board was to approve the application, the Bergmans requested that any transfer of ownership be subject to public review and scrutiny. They indicated that they had no certainty that whoever took over the systems operations would have the experience necessary to operate the plant safely. The Bergmans stated that it would be in the public's best interest for the transfer to be conducted under public scrutiny and they requested that this be a condition of approval.

8.3 Views of the Board

The Board notes Novagas's intention to sell the NGGS facilities in the near future and acknowledges that the sale of oil and gas facilities and the transfer of licences is a common occurrence in the industry. The Board also notes that should the licensee/ownership of the plants and the associated NGGS pipeline change, proper transfer documents must be filed with and approved by the EUB in accordance with Part 6 of the Oil and Gas Conservation Act, Part 4 of the Pipeline Act, and EUB *Guide 69: Energy Development Licence Transfer*, October 2000.

While the Board is sympathetic to the concerns raised by the interveners regarding the future operation of the applied-for facilities, it is confident that its approval process for the transfer of the licences will ensure continued public safety for the facilities. The Board notes that before a company can hold an EUB licence, it must meet the licence eligibility and qualifications set out in *ID 2000-7: Licence Eligibility and Qualifications for Potential Licensees and Agents*. The Board notes that *ID 2000-7* requires, among other things, that a licensee of a corporation be registered under the Business Corporation Act, be resident in Alberta or have an agent, and have reasonable and appropriate insurance. In addition, transfers are thoroughly scrutinized to ensure that the transferee is qualified to hold an EUB licence, is in good standing in respect of EUB requirements and regulations, and meets EUB transfer screening requirements set out in *ID 2000-11 (Amendment): Energy Development Licence Transfer Requirements and Monthly Corporate Licensee Liability Rating*. Further, the Board believes that the design and operation requirements applicable to the proposed facilities are appropriate and that all operators are required to meet its requirements. The Board is confident that should any matters of noncompliance arise in the future, whether by Novagas or with a subsequent owner of the proposed facilities, that they can be promptly addressed by the EUB enforcement process. For these reasons, the Board does not believe it necessary to condition the licences to require notification of any future transfers. As such, notification is mandatory.

The Board notes that Novagas said that it would consider selling the NGGS facilities before the applied-for pipeline construction and plant modification begin. As noted above, such a transfer would require the approval of the Board. Should Novagas request such a transfer, it may be viewed as a significant change in circumstances, thus entitling interested parties to request a review of this approval pursuant to Section 42 or 43 of the Energy Resources Conservation Act.

9 DECISION

Having carefully considered all of the evidence before it, the Board finds that Novagas and BP have demonstrated the need for the proposed modifications to the North and South Caroline plants. In addition, the Board has fully considered the proposed and alternative processing and pipelining options discussed at the hearing and finds in favour of the Harmattan gas plant proposal and the NGGS Red route pipeline proposal. The Board believes that the proposed NGGS pipeline route is acceptable and the pipeline can be constructed and operated in a safe and environmentally acceptable manner. Therefore, the Board approves Applications No. 1072191 and 1072188 subject to Novagas and BP meeting all the regulatory requirements and the conditions and commitments set out in Appendix 2.

Dated at Calgary, Alberta, on July 31, 2001.

ALBERTA ENERGY AND UTILITIES BOARD

<original signed by>

G. Miller
Presiding Board Member

<original signed by>

M. Bruni, Q.C.
Acting Board Member

<original signed by>

J. R. Nichol, P.Eng.
Acting Board Member

APPENDIX 1 TO DECISION 2001-62

The BP-operated North and South Carolina gas plants are “grandfathered” under the EUB’s current sulphur recovery guidelines and consequently are operated at lower sulphur recovery levels than would be applied to new plants of equivalent sizes. BP applied to convert the sour gas plants to dehydration and compression facilities and to transport the gas to an existing larger facility, the Harmattan gas plant, which operates at a higher sulphur recovery efficiency than the BP plants. The BP Caroline plants are currently approved by the EUB as follows:

	BP North Caroline	BP South Caroline
Location	LSD 1-11-35-6W5M	LSD 3 & 4-20-34-4W5M
Approved raw capacity	2105 10 ³ m ³ /d	1513 10 ³ m ³ /d
Approved sulphur inlet	11.3 tonnes/day	9.83 tonnes/day
Approved sulphur recovery	92.0%	85.0%
Liquids recovery		
• Ethane	—	—
• Propane	—	160 m ³ /d
• Butane	—	99 m ³ /d
• NGL mix	651 m ³ /d	—
• Pentanes plus	—	230 m ³ /d

The gas processing plants noted in the tables are shown on Figure 2, with the exception of the Husky Strachan plant.

The potential to connect gas currently processed at the BP and Apache Canada Ltd. operated Garrington plants was discussed in the hearing. It was noted that the plants do not currently have the capability to reduce the CO₂ content of the raw gas and that this may be required in the near future. The Garrington plants discussed at the hearing are currently approved by the EUB as follows:

	BP Garrington	Apache Garrington
Location	LSD 11-17-34-3W5M	LSD 13-5-34-3W5M
Approved raw capacity	563 10 ³ m ³ /d	563 10 ³ m ³ /d
Approved sulphur inlet	Sweet gas plant	Sweet gas plant
Liquids recovery		
• Ethane	184 m ³ /d	—
• Propane	—	—
• Butane	—	—
• NGL mix	217.5 m ³ /day	168 m ³ /d
• Pentanes plus	—	—

During the course of the hearing, options discussed for processing the gas from the BP Caroline plants and potentially the Garrington plants included the Shell Caroline, Husky Strachan (Ram River), KeySpan Strachan, and Novagas Harmattan-Elkton sour gas plants. Current EUB approval information for these plants is summarized as follows:

	Shell Caroline	Husky Strachan	KeySpan Strachan	Novagas Harmattan- Elkton
Location	Section 34 & 35-34-6W5M	Section 1 & 2-37-10W5M	LSD 11-35-37-9W5M	Section 27 & 34-31-4W5M
Approved raw capacity	10 850 10 ³ m ³ /d	17 749 10 ³ m ³ /d	7748 10 ³ m ³ /d	13 900 10 ³ m ³ /d
Approved sulphur inlet	5467.5 tonnes/day	4660.5 tonnes/day	971.1 tonnes/day	82.6 tonnes/day
Approved sulphur recovery	99.8% annual	98.1%	98.1%	98.6%
Liquids recovery				
• Ethane	—	—	—	2934 m ³ /d
• Ethane + mix	5460 m ³ /d	—	1878 m ³ /d	—
• Propane	—	—	—	1222 m ³ /d
• Butane	—	—	—	639 m ³ /d
• NGL mix	—	—	—	—
• Pentanes plus	4235 m ³ /d	430 m ³ /d	1383 m ³ /d	793 m ³ /d

The operators of the Shell Caroline, KeySpan Strachan, and Husky Strachan sour gas plants did not appear at the hearing or provide any evidence in support of their respective plants as an alternative to the proposed Novagas Harmattan processing option.

APPENDIX 2 TO DECISION 2001-62

SUMMARY OF THE APPLICANTS' COMMITMENTS AND CONDITIONS

Commitments

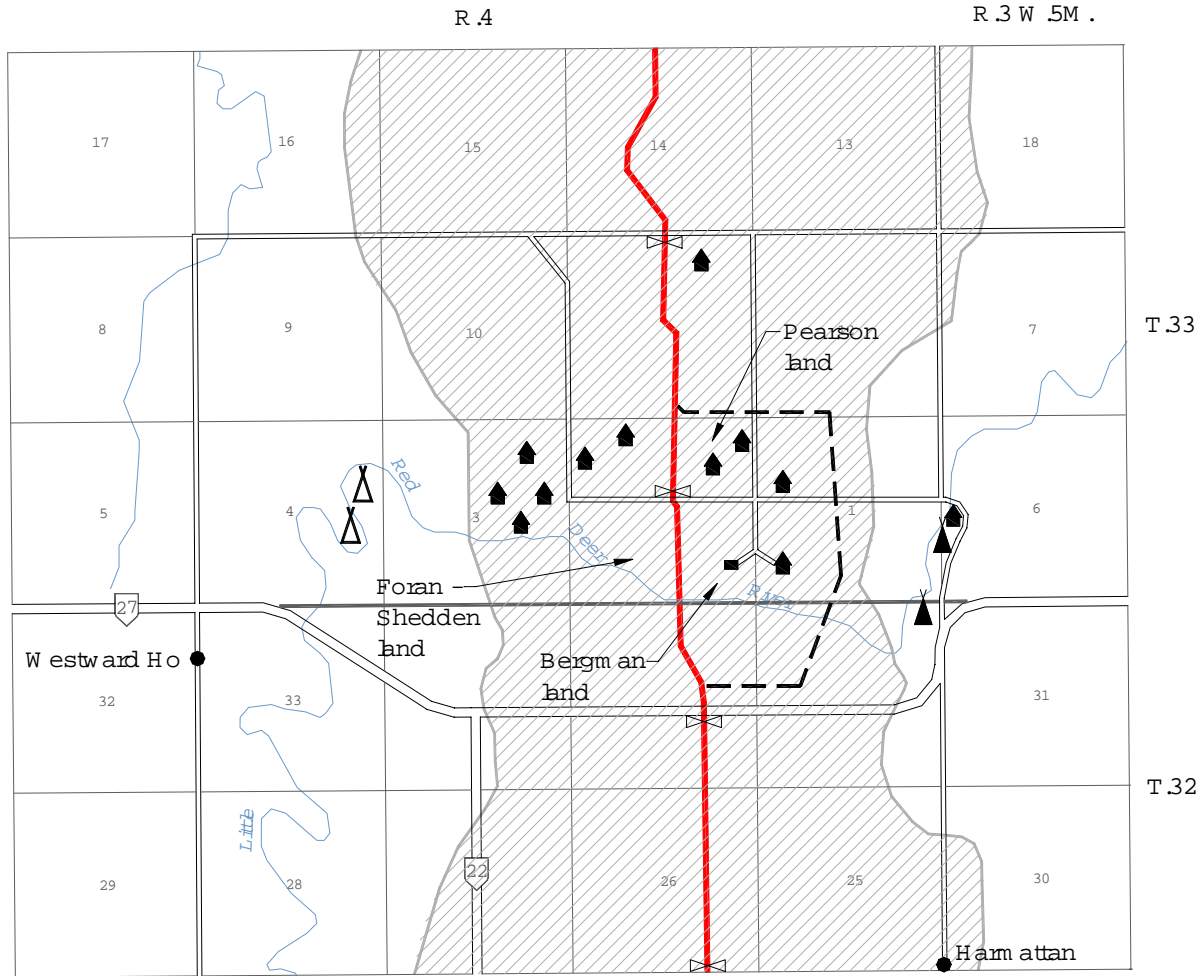
The Board notes that throughout the proceeding, the applicants undertook to conduct certain activities in connection with the proposed NGGS that are not strictly required by the EUB's regulations or guidelines. These undertakings are described as commitments and they are summarized below. It is the Board's view that when companies make commitments of this nature, they have satisfied themselves that the activities will benefit both the project and the public, and the Board takes these commitments into account when arriving at its decision. Having made the commitments, the Board expects the applicants to fully carry out the undertaking or advise the Board if, for whatever reasons, they cannot fulfill the commitment. It is at that time that the Board will assess whether the circumstances of the failed commitment may be sufficient to trigger a review of the original approval. Affected parties also have the right to ask the Board to review an approval if commitments made by an applicant remain unfulfilled.

- 1) Novagas shall continue to assess the reliability of low-level leak detection systems and will consider installation on the NGGS if an appropriate system becomes available.
- 2) Novagas commits to directionally drill the Red Deer River crossing, the Eagle Creek crossing, and the Little Red Deer River crossing.
- 3) Novagas commits to have the drilling contractor independently evaluate the feasibility of the Little Red Deer River crossing and the suitability of the proposed construction method, as well as to continually monitor the drilling operation of the crossing.
- 4) Novagas commits to avoid any drilling or construction activities on the Bergmans' property during the late winter, when the area is subject to greater use by local area wildlife.
- 5) Novagas commits to continue to include the Harmattan Bible camps and Westward Ho in its ERP and the additional planning that it will carry out for the ERP.
- 6) Novagas shall conduct baseline water quality and quantity tests for the Bergmans and Foran-Sheddens. The Board notes that this information could be assessed if there are any changes in the future to the Bergmans' and Foran-Sheddens' water supply.

Conditions

The conditions imposed in the present approval are summarized below. Conditions generally are requirements in addition to or otherwise expanding upon existing regulations and guidelines. Conditions must be complied with by an applicant or it is in breach of its approval and subject to enforcement action by the EUB. Enforcement of an approval includes enforcement of the conditions attached to that approval. Sanctions imposed for the breach of such conditions may include the suspension of the approval, resulting in the shut-in of the facility.

- 1) The NGGS pipeline will cross the Bergmans' entire quarter section using HDD techniques or a combination of HDD and boring techniques, unless Novagas can demonstrate to the satisfaction of the Board that it is technically not possible to do so.
- 2) If the entire Bergman section cannot be crossed using the techniques described in condition 1, Novagas must use trenching or isolation techniques that result in minimum disruption to the Bergmans' property.
- 3) The Board requires Novagas to submit its complete NGGS ERP, including its recreational study of the Little Red Deer River crossing area for EUB consideration and approval prior to Novagas operating the NGGS pipeline.
- 4) The applicants said that their aggressive schedule would require six months from approval to start-up of the proposed NGGS project, but they indicated that a period of nine months would be a reasonable target for converting the North and South Carolina plant licences from sulphur recovery plants to compressor stations. The Board therefore requires that the changes to the North and South Carolina plant licences come into effect with the start-up of the new facilities or within twelve months, whichever ever occurs first following the date of this decision report.



Legend










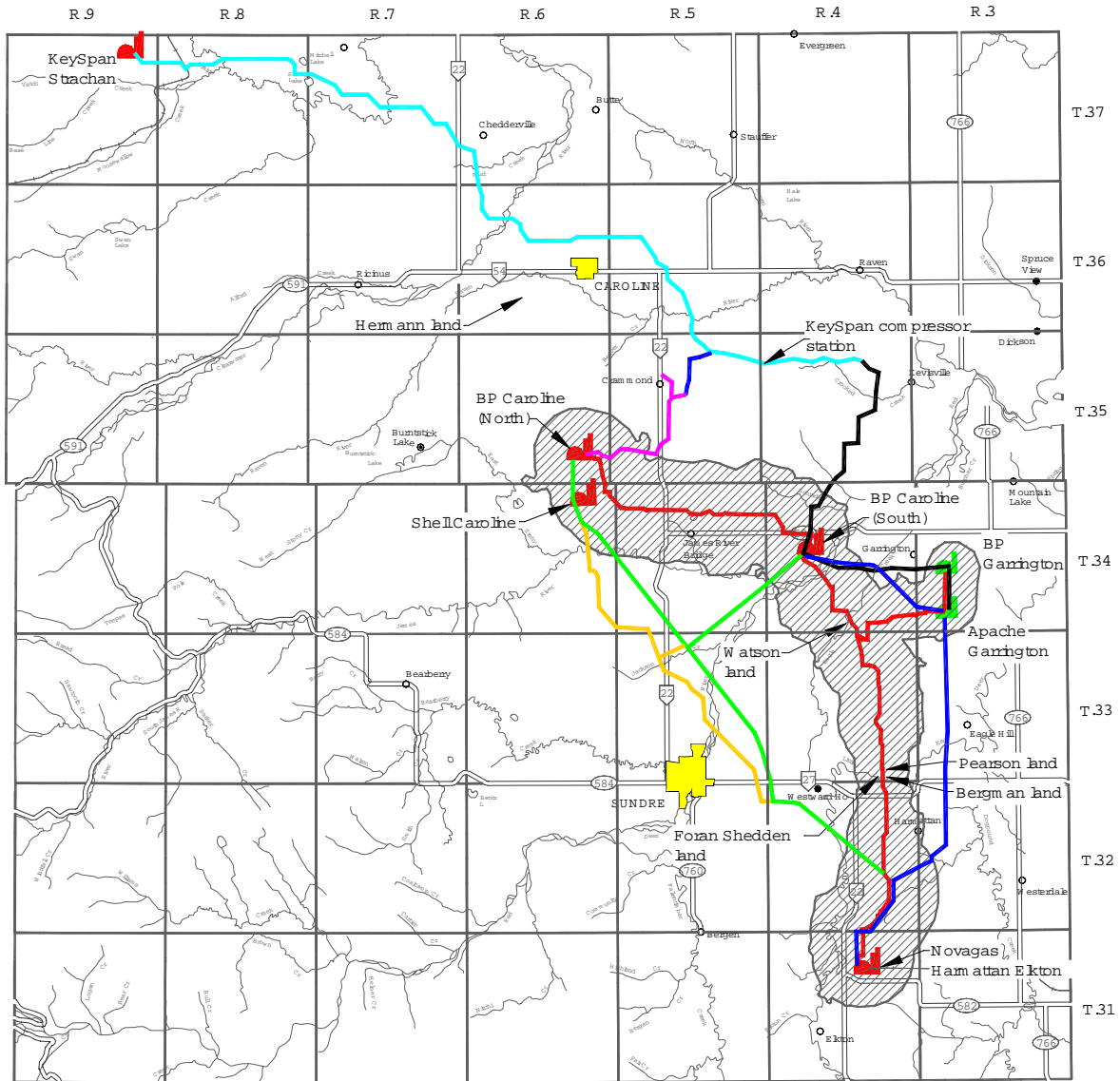
- | | | | |
|---|-------------------|---|---------------------------|
|  | Proposed pipeline |  | Hamattan Bible camps |
|  | Jog route |  | Residence (not all shown) |
|  | Existing roads |  | Machine building |
|  | Proposed EPZ |  | Emergency shutdown valve |
| | |  | Westward Ho camps |

Figure 1. Hamattan Ekton and Caroline Fields
 Applications No. 1072191, 1072188
 Novagas Canada Ltd. and BP Canada Energy Company



Legend

- Proposed pipeline route (NGGS)
- Blue route
- Nova route
- Sulphur route
- Existing KeySpan pipeline (potential use)
- Existing BP pipeline (potential use)
- New pipeline required for KeySpan Stachan option
- Existing sour gas plant
- Existing sweet gas plant
- Proposed EPZ (residences not shown)

Figure 2. Hamattan Ekton and Caroline Fields
 Applications No. 1072191, 1072188
 Novagas Canada Ltd. and BP Canada Energy Company

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